

# SP2H20065D1

## 650V Silicon Carbide Diode

### Features

- 650-Volt Schottky Rectifier
- Shorter recovery time
- High-speed switching possible
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- Positive Temperature Coefficient on VF

### Benefits

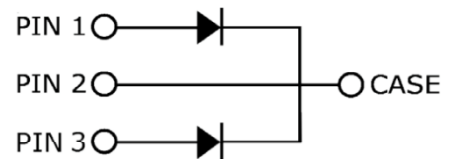
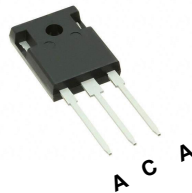
- Higher safety margin against overvoltage
- Improved efficiency all load conditions
- Increased efficiency compared to Silicon Diode alternatives
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway
- Essentially No Switching Losses

### Applications

- Switch Mode Power Supplies
- Power Factor Correction
- Motor Drives
- HID Lighting

### Package

Type : TO-247-3Lead



### Absolute Maximum Ratings

$T_c = 25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	SP2H20065D1	Units
VRRM	Repetitive Peak Reverse Voltage	650	V
VRSM	Surge Peak Reverse Voltage	650	V
VDC	DC Blocking Voltage	650	V
IF	Continuous Forward Current (Per Leg/Device) @Tc=25°C @Tc=135°C @Tc=149°C	27.5/55 13/26 10/20	A
IFRM	Repetitive Peak Forward Surge Current (Per Leg) @TC=25°C, tP = 10 ms, Half Sine Wave	70	A
IFSM	Non-Repetitive Peak Forward Surge Current (Per Leg) @TC=25°C, tP = 10 ms, Half Sine Wave	90	A
Ptot	Power Dissipation (Device) @Tc=25°C @Tc=110°C	136 59	W
TJ , Tstg	Operating Junction and Storage Temperature	-55 to +175	°C

## Electrical Characteristics

$T_C = 25^\circ \text{C}$  unless otherwise noted

Symbol	Test Conditions	Test Conditions	Min	Typ	Max	Unit
VF	Forward Voltage (Per Leg)	IF=10A, TC=25° C IF=10A, TC=175° C	-	1.5 2.2	1.8 3.0	V
IR	Reverse Current	VR=650V, TC=25° C VR=650V, TC=175° C	-	30 50	100 400	μA
QC	Total Capacitive Charge	VR =400V, IF =20A TJ = 25° C $Q_c = \int_0^{V_r} C (V) dv$	-	24	-	nC
C	Total Capacitance	VR =0V, TJ = 25° C, f=1MHz VR =200V, TJ = 25° C, f=1MHz VR =400V, TJ = 25° C, f=1MHz	-	487 50 35	-	pF
EC	Capacitance Stored Energy	VR=400V	-	4.8	-	μJ

## Thermal Characteristics

Symbol	Parameter	Typ	Unit
RθJC	Thermal Resistance from Junction to Case	1.8	°C/W

## Typical Characteristics

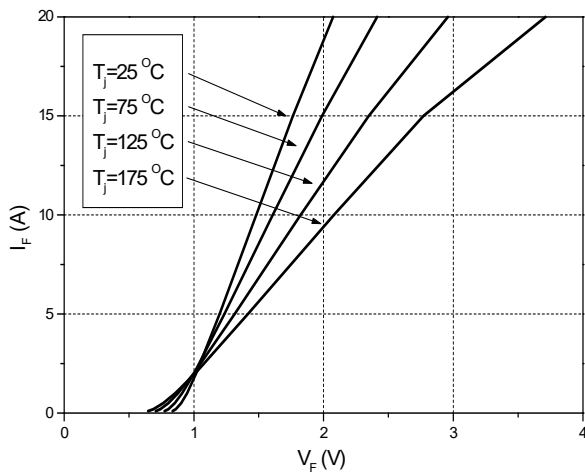


Figure 1. Forward Characteristics

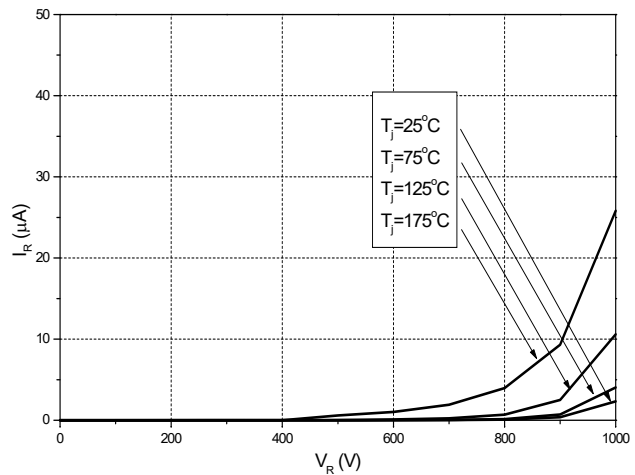


Figure 2. Reverse Characteristics

# Typical Characteristics

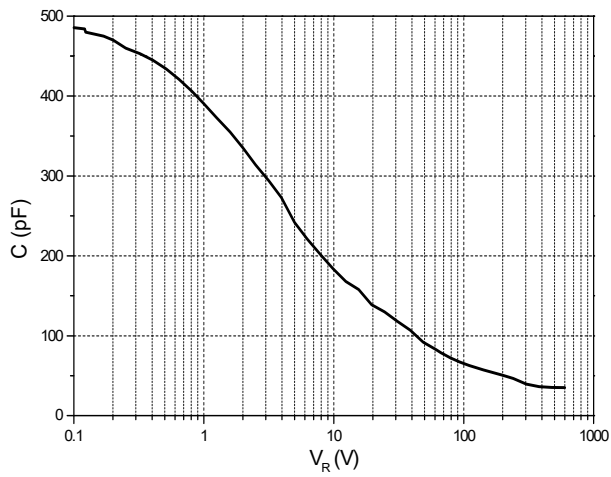


Figure 3. Capacitance vs. Reverse Voltage

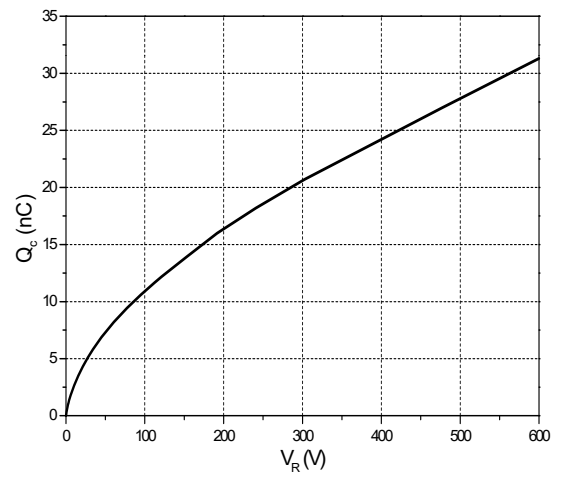


Figure 4. Total Capacitance Charge vs. Reverse Voltage

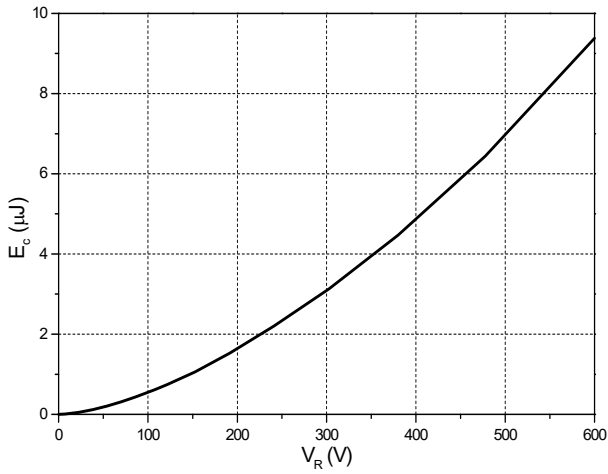
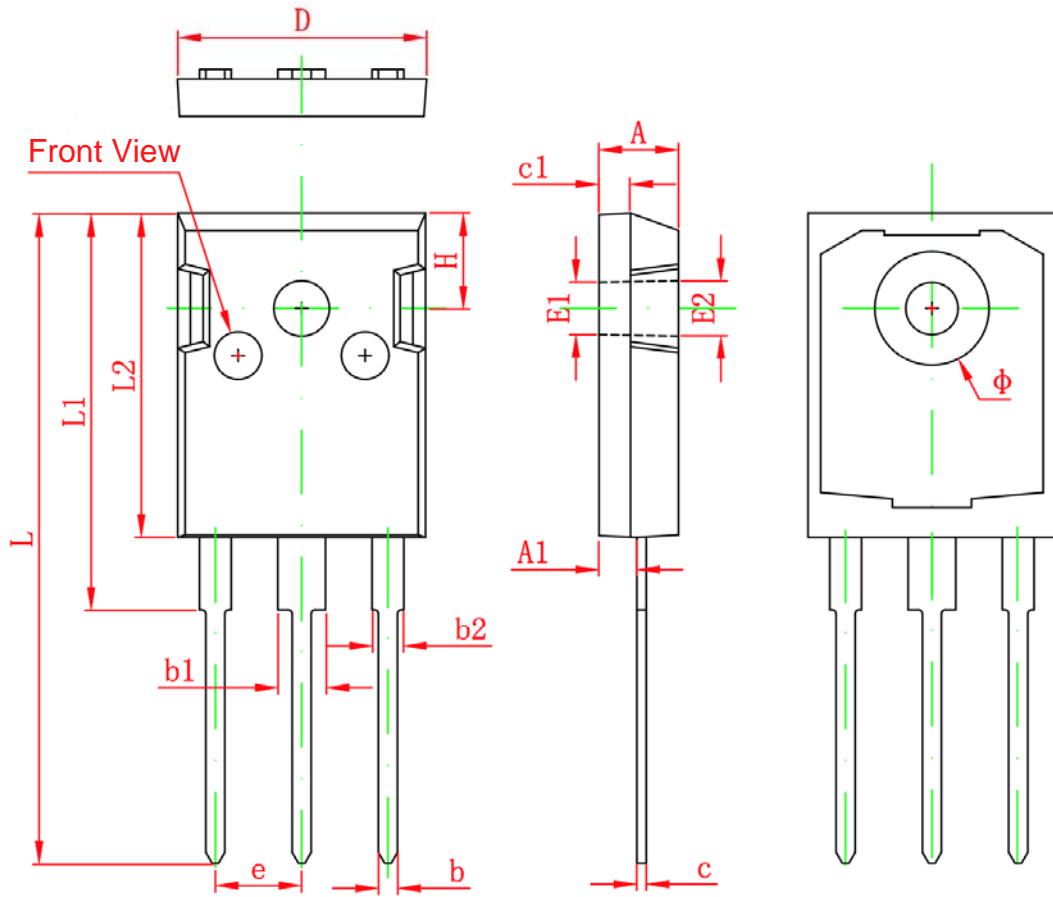


Figure 5. Capacitance Stored Energy

## Package Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.850	5.150	0.191	0.200
A1	2.200	2.600	0.087	0.102
b	1.000	1.400	0.039	0.055
b1	2.800	3.200	0.110	0.126
b2	1.800	2.200	0.071	0.087
c	0.500	0.700	0.020	0.028
c1	1.900	2.100	0.075	0.083
D	15.450	15.750	0.608	0.620
E1	3.500 REF		0.138 REF	
E2	3.600 REF		0.142 REF	
L	40.900	41.300	1.610	1.626
L1	24.800	25.100	0.976	0.988
L2	20.300	20.600	0.799	0.811
Φ	7.100	7.300	0.280	0.287
e	5.450 TYP		0.215 TYP	
H	5.980 REF		0.235 REF	
h	0.000	0.300	0.000	0.012